

Donations to the Library were reported and thanks were ordered for them.

The decease of the following members was announced :

Mr. William Woodnut Griscom, of Philadelphia, on September 24, 1897, æt. 46.

Dr. Harrison Allen, at Philadelphia, on November 14, 1897, æt. 56.

Mr. R. H. Mathews presented a paper on "Rock Carvings and Paintings of the Australian Aborigines."

The Society resolved itself into the Committee of the Whole, and continued the consideration of the proposed amendments to the Laws.

The Committee rose and reported. The Society resumed its session, Vice-President Pepper in the Chair.

The Finance Committee reported upon the legacy of Henry Phillips, Jr., deceased.

The meeting was adjourned by the presiding officer.

ROCK CARVINGS AND PAINTINGS OF THE AUSTRALIAN ABORIGINES.

(Plate X.)

BY R. H. MATHEWS, L.S.

(*Read November 19, 1897.*)

INTRODUCTORY.

The wide distribution throughout Australia of these native drawings would lead us to expect that the figures of animals and various objects carved upon large rocks—and the groups of hands, varying in number and in relative position, as well as weapons and other tribal devices painted on the walls of caves—had some symbolical meaning in connection with the myths and superstitions of the natives, or were commemorative of events and scenes in the history and life of the tribes. Most of the figures of animals were probably intended to represent the totems of the different families; but it seems reasonable to suppose that some of the smaller drawings and

nondescript devices are the result of idle caprice. The production of some of the larger groups—both of carvings and paintings—has been a work of immense labor, and it is unlikely that the natives would have taken so much trouble for mere amusement.

Aboriginal drawings are almost everywhere of the same character, with but little variation either in the subjects treated or in the style of workmanship. They consist chiefly of stenciled and impressed hands, outline drawings of human forms, animals and a few nondescript devices. In many of the caves we find groups of lines varying in length from about four inches to two feet. Sometimes the series consists of two or three lines; in other cases there are as many as about a dozen. They are generally drawn vertically or only slightly inclined, but are occasionally met with in a nearly horizontal position. The native artists had no idea of perspective, and their figures are not copied from nature, but are apparently drawn according to some conventional pattern which has probably been handed down from a remote period. The stenciled drawings cannot be called copying from nature, and may, therefore, be included in the conventional type.

Owing to our limited acquaintance with the subject, it would obviously be premature at present to advance any far-reaching theory as to the signification of these drawings. What we should endeavor to accomplish is the collection of all the facts now obtainable respecting these works of native art, by careful observation and inquiry in all parts of Australia. This would, I feel convinced, yield results of more than ordinary interest. The information thus gathered should be systematically compared and classified, from which it may be possible for us to arrive at some definite conclusion in reference to the purpose of these drawings, and perhaps furnish an important link in regard to the prehistoric colonization of this continent. This work should be undertaken without delay, because the farther we get away in point of time from the period of production of these pictures, the more difficult will it obviously become for us to obtain satisfactory explanations as to their meaning and origin. There are many difficult points which require much closer attention than they have yet received.

Writing under the date of February, 1788, Capt. Watkin Tench mentions some carvings seen by him upon rocks in the vicinity of Sydney;¹ and in January, 1803, Capt. M. Flinders discovered some

¹ *A Narrative of the Expedition to Botany Bay* (1789), p. 79.

rock paintings on Chasm Island, in the Gulf of Carpentaria.¹ These are the earliest authentic records of the discovery of carvings and paintings respectively in any part of the Australian continent, so far as I am aware. Since that period rock paintings have been found in several places in West Australia, South Australia, Victoria, Queensland and New South Wales. The rock carvings have also been observed in a few localities, long distances apart, in all the colonies mentioned with the exception of Victoria. The fact of these carvings not being reported in Victoria may probably be attributed to their having escaped the notice of investigators rather than to their non-existence.

Among the Darkinung tribe of aborigines, who occupied the country from the Hunter river to the Hawkesbury, I had the good fortune to meet a few natives who told me that when they were boys they had seen both painting and carving on rocks done by their countrymen, between the years 1843 and 1855, and it is probable that the practice was continued for some years later. From the last-mentioned date to the present the blacks have disappeared very rapidly by death, and the few survivors have lived chiefly amongst their white supplanters, abandoning most of their former customs.

To those who may be desirous of taking part in investigations respecting this subject a few practical directions relating to taking the necessary notes and the subsequent preparation of the plates for publication may be found of some assistance. The investigator should provide himself with a suitable note-book, a pencil, a tape measure of thirty-three or sixty-six feet in length and an ordinary pocket compass.

On reaching a cave containing paintings a careful sketch of all the figures in the relative order in which they appear upon its walls should first be made. Then note down the dimensions of every figure in this sketch, and at the same time fix by measurements their relative position to each other. If the paintings consist of different colors these should be carefully noted in the sketch. The dimensions of the cave should be measured, and the direction which it faces should be taken with the pocket compass; the bearing and approximate distance from some conspicuous or well-known point should also be stated, as this information will greatly facilitate its identification by others.

In making notes of carvings found on the surfaces of rocks a

¹ *A Voyage to Terra Australis*, Vol. ii, pp. 188-189.

similar course may be adopted, sketching and measuring each figure. The width and depth of the grooves along the outlines should be ascertained, and the direction which the rock slopes stated. In any case of either paintings or carvings where the investigator has not time or is unable for any other reason to copy the drawings, he should describe them as fully as possible, and state their geographical position as nearly as he can, for the purpose of enabling others to find them* at any future time.

In reproducing cave paintings from the notes taken in the field they should first be outlined in pencil in their relative positions from the sketches and measurements given in the field book, and afterwards drawn in the colors in which they appear on the rock. The carvings will be reproduced in the same manner and then drawn in with Indian ink. Plates for publication should be drawn the size, or some multiple of the size, of a page of the journal in which they are to appear. It is generally found more convenient, especially if the objects are small or numerous, to draw the plate on a larger scale than that required, because it can afterwards be reduced by photography or otherwise to the proper size for publication.

In describing the rock pictures of the Australian aborigines and explaining how they were executed by the native artists, it will be desirable to treat the subject under two divisions, one being headed "Carvings" and the other "Paintings." In the former the outlines of the figures were in some cases cut and in others ground into the surface of the rock with sharp-pointed pieces of stone; in the latter the pictures were painted on the rock in the required colors; different methods being employed in doing the work.

ROCK CARVINGS.

Rock carvings are found in districts abounding in large masses of rock, chiefly of the Hawkesbury series, but sometimes granitic and metamorphic rocks are used, where the softer sandstones are not available. Occasionally the rock surface containing the carvings is almost level with the surrounding land, and in other cases the drawings have been executed on the tops or sides of rocky masses several feet high. Some of the smallest of the rock surfaces on which these delineations appear do not exceed ten feet square, but they are generally much larger, and in a few places the table of rock, intersected here and there by fissures, was scarcely less than two

acres in extent, the carvings being numerous and widely scattered over it. These drawings are generally found on the tops of horizontal rocks, but are sometimes met with on the smooth walls of rocks occupying various slopes between the horizontal and the perpendicular position.

Denuded rocks are more general on the tops and sides of hills than elsewhere, owing to the soil and disintegrated matter being carried away by the weather to lower levels, hence we find these carvings more numerous in such situations than in the valleys, where masses of rock are less plentiful. It is obvious, however, that the natives, with their primitive tools, would be guided more by the suitability of the rock for their purpose than by its location; but where circumstances permitted, preference seems to have been given to rocks occupying prominent positions or which were situated in mountain passes along which the natives traveled from one part of their hunting grounds to another. Fine-grained sandstones of a durable character, with tolerably smooth surfaces and in dry situations, appear to have been chosen.

In nearly all carved figures, owing to age or weathering, the grooves along their outlines have assumed the same color as the original undisturbed surface of the rock. Some of them can be seen without difficulty, but numbers of them are so much defaced by long exposure to the weather that it requires some practice to be able to distinguish them, and they would be passed by unobserved by any person unaccustomed to them. They are more easily seen on sunny than on cloudy days on account of the light falling on all parts of the figure when viewed from different standpoints. The best time to observe those which are very faint is either on a dewy morning shortly after sunrise, or any time after a shower of rain; the dew or the rain, as the case may be, collects in greater quantities in the grooves than elsewhere and indicates their position.

Some of the carvings are so indistinct that it is necessary to make a chalk mark along the grooves before a complete idea of the outline of the figure can be obtained. Most of them exhibit tolerably strong likenesses of the objects they are intended to represent, but some grotesque drawings occasionally met with were probably intended for legendary monsters, or creatures of the native artist's imagination.¹

¹ For examples of these mythologic and strange drawings, see my papers in the following publications: *Proc. Roy. Soc. Victoria*, vii, N. S., Pl. ix, Fig. 10; *Proc. Roy. Geog. Soc. Aust.*, Qld. Brch., x, Pl. ii, Fig. 15; *Am. Anthropol.*, Wash., viii, Pl. ii, Fig. 30; *Journ. Anthropol. Inst.*, Lond., xxv, Pl. xvi, Fig. 6.

In the production of rock carvings three methods were employed by the native artists. 1. That most generally adopted was to cut the outline of the required figure on the rock. It is probable that the object to be delineated was first designed by making a mark with a piece of colored stone or hard pebble along the lines to be cut out. A number of holes were then made close together along this outline, and these were afterwards connected by cutting out the intervening spaces, making a continuous groove of the required width and depth. From the appearance of the punctured indentations made along the lines thus cut out, I am led to assume that the natives had a hard stone or pebble chipped or ground to a point and used as a chisel. Such a chisel could have been used either by holding it in the hand or otherwise and hitting it with another stone, or by fastening a handle to it and chopping with it in the same way that a tomahawk is used. As soon as the outline was chiseled out to the required depth, it is not unlikely that a stone tomahawk, in addition to the chisel, was used in completing the work, because the sides of the grooves were cut more evenly than would have been possible with such an instrument as that with which the holes were punctured. From the smoothness of the edges of the grooves in a few of the best executed figures I am inclined to think it probable that after the chiseling and chopping out was finished the edges were ground down by rubbing a stone along them, to give them an even and regular appearance.

2. In other instances the whole surface of the rock within the outline of the figure was cut away to the same depth as the exterior groove, as in the cases mentioned by Capt. Wickham in his description of the carvings on Depuch Island, on the coast of West Australia, published in the *Journal of the Royal Geographical Society*, London, Vol. xii, pp. 79-83.

3. Another method was to trace on the rock all the lines of the object to be drawn, and then to form a groove by repeated rubbing with a hard stone or pebble along the outlines which had been so designed until the entire figure was completed. Carvings executed upon rocks in this way have been observed in West Australia and in some of the other Australian colonies.

In a previous communication to this Society¹ I furnished a plate containing sixty-one figures of men, women and children, kangaroos, emus, fish, wombats, snakes, native weapons, etc., together with

¹ PROC. AMER. PHILOS. SOC., Vol. xxxvi, pp. 195, Pl. iv, Figs. 1-61.

some land and marine monsters the types of which do not exist in nature, so that it will not be necessary on this occasion to add any further examples of aboriginal carvings. The present article, taken in conjunction with my former paper, will be found to place the subject of Australian rock pictures in a tolerably complete form before scientific men who may be engaged upon similar investigations in America.

ROCK PAINTINGS.

Cave paintings are necessarily restricted to those parts of Australia in which suitable rocks for the purpose are obtainable. They are sometimes met with in weather-worn cavities at the bases of separate boulders, but much more generally in rocky escarpments, of more or less continuity, on the sides of hills or watercourses. These cavities or shelters owe their origin to the natural wasting away of a softer stratum of the rock, leaving a harder layer overhanging, which forms the roof of the cave. In most cases they get narrower and lower as they go back into the rock; but some are small at the entrance and become higher and larger as they recede, having a somewhat dome-shaped interior. Some of them are of great extent, being more than one hundred feet in length, upwards of twenty feet high and extending back into the rock about twenty-five feet; while some are merely shallow crescent-shaped hollows of small dimensions weathered out of the face of a boulder or escarpment.

Many of the larger shelters have been used by the natives as camping places for considerable periods. This is evident from the smoke stains on the roofs and also from the remains of ashes and cinders on the floors. In digging into some of these floors, fragments of the bones of animals, broken implements such as tomahawks, knives¹ and other articles used by the natives are found covered over with ashes and other *débris*, in some instances to the depth of one or two feet. These shelters are mostly found in the proximity of streams of a more or less permanent character, from which water was probably obtained for camp use during the occupancy of the cave. Very small shelters would obviously be unsuitable for residential purposes.

¹ See my paper on "Stone Implements Used by the Aborigines of N. S. Wales," *Journ. Roy. Soc. N. S. Wales*, xxviii, p. 304, Pl. xliii, Fig. 2.

Most of the paintings are executed on the cave walls, but they are not infrequently drawn on the roofs, and are sometimes found in both these positions in the same cave. They are generally within the reach of an individual standing on the ground, but in a few instances I have found them at heights varying from eight, twelve and eighteen feet above the floor. In such cases it is likely that the natives stood on ledges of rock which have since weathered away, or on a staging erected for the purpose.

These paintings are nearly always drawn on the natural surface of the rock, but in some cases I have found that the cave wall had previously been painted a different color to that employed in the figures executed upon it. In one case the wall had first been colored red and on this background the figures had been drawn in white.¹ A similar instance of white painting on a ground of red ochre rubbed on the cave wall is mentioned by Capt. P. P. King² as having been observed by him in 1821 at Clack's Island, Prince Charlotte's Bay, Queensland. Capt. Grey states that the rock around one of the figures seen by him in West Australia in 1838 was painted black in order to produce the greater effect.³ In some of the caves visited by me I found that the walls had been blackened before the paintings were made upon them.⁴

Owing to the weathering of the cave walls, in some instances the paintings are barely discernible; and in such cases I have found that one can see them better by standing several yards off than when very close to them. It is well to observe them from more than one standpoint, so that they may be seen with the light falling upon them in different directions, for the purpose of bringing into view faint lines which might otherwise escape notice.

Throughout my observations respecting this subject I have found that the natives in selecting rock shelters in which to produce their paintings always chose those whose walls consisted of smooth surfaces on which the objects could be delineated and at the same time sufficiently hard to be durable. Caves consisting of soft, friable sandstone, or which were situated in damp localities, or were exposed to storms, were rejected as unsuitable. I have also found that far the greater number of these shelters have a northerly aspect,

¹ *Proc. Roy. Geog. Soc. Aust.*, Q. Branch, x, p. 65, Pl. ii, Fig. 8.

² *Survey Intertropical Coasts of Australia*, ii, pp. 26, 27.

³ *Two Expeds. N. W. and W. Australia*, i, p. 202, Fig. 1.

⁴ *Four. Anthropol. Inst.*, xxv, pp. 157, 158, Pl. xiv, Fig. 2.

thus receiving more or less of the sun's rays on every sunny day. In the large number of these rock shelters inspected by me those which were the most exposed to the sun's rays were the best preserved; and it would appear from the fact that most of them face the direction of the sun that this was known to the aborigines.

Aboriginal rock paintings have been executed in three different ways, viz., stenciled, impressed and outlined. 1. In the stencil method the extended hand was placed firmly on the smooth surface of the rock and the required color blown or squirted over it out of the mouth. Sometimes the rock was first wetted and the color blown in a dry state around the object; in other instances the color was wetted and was then squirted out of the mouth. Drawings done in the last-mentioned way can be easily distinguished from those stenciled with dry powder. This method of drawing was also frequently used in representing native weapons such as tomahawks, boomerangs, waddies, etc. Small animals such as fish, human feet and the feet of animals are also sometimes shown in this way. The color in some of the larger figures appears to have been applied in a wet state with a tool similar to a brush or mop.

In many of the stenciled pictures of the hand it is probable that the latter was held in position on the rock and the color applied by the same individual; but in representations of feet and native weapons, some of the latter being three or four feet in length, it would be necessary for two or more persons to participate in the work. A modification of this method was to previously color the surface of the rock and afterwards to stencil the hand or other object upon it in a different color. This mode of drawing was very effective, especially when the ground was red and the stenciling was done in white.¹

Stenciled drawings of the shut hand are occasionally met with. In these cases the hand with the fingers shut, but the thumb extended was placed against the rock and stenciled in the usual way.

2. In the impression method the palm of the hand of the artist was either rubbed over with a liquid color or was dipped into it, and while wet was firmly pressed against a smooth surface on the cave wall. Upon removing the hand, the colored impression of it was left clearly defined upon the rock.

¹ For an example the reader is referred to the cave described by me in the *Proc. Roy. Geog. Soc. Aust.*, Q. Branch, x, pp. 46-70, Pl. ii, Fig. 8.

A variation of this method of drawing was to impress the hand in the manner described and before removing it from the rock to squirt a different color around its margin. This may be more correctly called a combination of the impression and stencil methods.

In the districts visited by me in collecting information on this subject I have found impressed hands¹ in comparatively few caves, the stencil method being that generally adopted. It may be that impressed hands had some particular meaning. In both these methods of drawing it was always the palm and never the back of the hand which was used.

3. Objects which could not be either stenciled or impressed, such as men, animals and a number of nondescript figures and devices appearing on the walls of these rock shelters, have been drawn in outline in the color selected for the purpose. In some cases the objects are shown in outline only; in other instances the space within the outline is painted with a solid wash of the same tint; whilst not infrequently this space is shaded by means of lines drawn either all in the same color or in two or more different tints.

It is not very clear what the nature of the coloring matter was in all instances, but it undoubtedly possessed the durability of an ordinary pigment. In the drawings which appear in red there is no doubt that most of them are done with red oxide of iron, found as a clay and known as red ochre. The white color would probably be pipe clay or fine white ashes from the camp fire. The few drawings done in yellow are produced by an oxide of iron found as a clay in the same districts where the pipe clay and red ochre occur. The black color appears to have been done with charcoal or soot.

In cases where it was necessary to use any of these colors in a liquid form they were first reduced to a powder and were then mixed with water or with oil obtained from some animal. When applied in a dry state a piece of the required color, as a lump of red ochre, or pipe clay, or charcoal, was held in the hand of the operator and the necessary lines drawn with it upon the rock, the surface of which was probably first moistened with animal fat or water

¹ The earliest reference I can find to the "impression method" is that by Sir George Grey. He states that in a cave in the district of York, West Australia, there is "the impression of a hand which had been rubbed over with red paint . . . and then pressed on the wall" (*Two Expeds. N. W. and W. Australia* (1841), Vol. i, pp. 260, 261).

along the outline of the figure to be drawn, which would have the effect of assisting the color to penetrate it.

Whether the color was applied as a liquid or a solid, water or grease appears to have been employed to work it into the surface of the stone and give it greater permanency. This is easily demonstrated by rubbing the figures with a wet cloth, which has no effect upon them; but if the same test be applied to the initials of white visitors written with chalk or charcoal in some of the shelters they rub off at once.

Vegetable colors were also known to the aborigines. Mr. E. Stephens says¹ that the natives of the lower Murray river and Adelaide plains painted red bands on their shields by means of the juice of a small tuber which grew in abundance in the bush. Sir George Grey stated² that he imagines that the blue color used in paintings seen by him on the Glenelg river in West Australia was obtained from the seed vessels of a plant very common there, which on being broken yielded a few drops of a brilliant blue liquid. I have myself stated³ that the apple tree and also the grass tree of Australia yield a red gum or resin, which has the property of staining anything a red color.⁴

EXPLANATION OF PLATE X.

All the figures represented on this plate are drawn to scale from careful sketches and measurements taken by myself, and the position of each cave on the public maps is accurately described by reference to the nearest purchased land in the vicinity. All the caves are in New South Wales.

Cave 1 consists of a weather-worn cavity in a large boulder of Hawkesbury sandstone within Portion No. 6, of fifty and three-quarters acres, in the parish of Bulga, county of Hunter. The interior is forty-two feet long, seventeen feet from the front to the back wall and eight and a half feet high. It faces S. 70° E., and has apparently been used as a camping place by the aborigines.

¹ *Jour. Roy. Soc. N. S. Wales*, xxiii, p. 487.

² *Two Expeds. in N. W. and W. Australia*, i, pp. 262, 263.

³ *Froc Roy. Soc. Victoria*, vii, N. S., p. 146.

⁴ Mr. E. M. Carr mentions that the natives of the Leichhardt river, Queensland, imprinted their hands, stained with red ochre or blood, on a conspicuous tree (*The Australian Race*, ii, p. 301).

The plate shows four hands—one of them being the right—done in white stencil. Amongst these is a human figure in black outline filled in with shading of the same color. There is permanent water in Wareng creek, five or six chains distant.

Cave 2 is situated within Portion No. 41, in the parish of Coolcalwin, county of Phillip, about ten chains from Jolly's Downfall creek, in which water is permanent. The cave is in a large isolated sandstone boulder, near the base of a rocky spur, and the entrance faces the northwest, so that it gets the afternoon sun throughout the year. Its length is fourteen feet, depth eighteen feet, with a height at the entrance of three feet, which increases to five and a half feet inside. The rocky floor has several natural interstices extending the whole length of the cave, with a few others nearly at right angles to them, caused by the disintegration of the softer parts of the sandstone, giving the floor the appearance, at first sight, of having been paved.

All the drawings in this cave, except the turtle, are executed in the stencil method, in red color. There are fourteen hands, several of which have some of the fingers missing; two are smaller than the rest; and in one the arm is shown nearly as far as the elbow. There is a rude representation of what may be either a turtle or a beetle, outlined in black and filled in with a wash of white. A child's right foot and two small bent objects complete the drawings.

Cave 3. This rock shelter is on Portion No. 81, of one hundred and eight acres, parish of Bulga, county of Hunter. Its length is fifty-four feet, depth eleven feet, and its height varies from four and a half to six and a half feet—the roof being level, but the floor irregular. The cave faces N. 20° E., and looks out upon a small watercourse. These drawings are all upon the roof, and are done in white stencil. They consist of eleven hands, one of which is very small; two native tomahawks with handles attached, and two other weapons. The position of the hands as well as the weapons is unusual and were probably intended to convey some meaning.

Cave 4. This cave is situated within Portion No. 31, of sixty-one and a half acres, parish of Merroo, county of Cook, near the right bank of a small gully in which water can be obtained during the winter months. It has been worn out of a low escarpment of Hawkesbury sandstone and faces the west; its length is twenty-three and a half feet and the depth eleven feet. Owing to the dome-

shaped roof, the height inside is seven and a half feet, whilst that at the entrance is only five feet.

The drawings consist of a number of hands, ten of which are still distinguishable; one tomahawk with handle, and three boom-crangs—all executed in white stencil. There is also a drawing which appears to be intended for a snake or an adder, and eight iguanas, varying in length from two feet to three and a half feet. The snake or adder and the iguanas are drawn in black outline, shaded with a wash of the same color within their margins.

NOTE.—I wish to make the following corrections in my paper on “Australian Rock Carvings,” published in the PROCEEDINGS of this Society, Vol. xxxvi, No. 155:—

At page 200, line 5, for “western” read “northern.”

At same page, line 6, for “No. 23” read “No. 83.”

At page 203, line 8, for “portion” read “position.”

At page 205, line 20, for “lind” read “line.”

Figs. 39, 42 and 43, are on the same rock as Fig. 26.

Stated Meeting, December 3, 1897.

Vice-President PEPPER in the Chair.

Present, 19 members.

Mr. George Vaux, Jr., and Mr. William Tatham, newly elected members, were presented to the presiding officer, and took their seats.

Mr. Edmunds, by unanimous consent, offered the following:

Resolved, That a Committee of five members be appointed by the Chair to report as soon as may be, such further amendments to those proposed by the Committee reporting the Laws now under consideration, as shall by them be deemed best, and especially to provide for a separation of the Laws of the Society required by its Charter, from the regulations of administration and order which need not be in its Charter Laws, and that meantime the proposed revision of the Laws now pending, stand over from stated meeting to stated meeting until disposed of.

Adopted.